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of Rusties feeding fledglings. This was near a colony of Bronzed Grackles, and it is possible that their previous nests may have been disturbed, but it seems probable that this may have been a second brood.

About the middle of July, the Rusty families seem to desert their solitary breeding haunts, and again become gregarious, and are seen in small flocks, flying high overhead, between the lakes, or feeding along their shores, getting ready for their southern migration.

*Dudley Road, Newton Centre, Mass.*

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## THE GENERA OF CERYLINE KINGFISHERS

BY WALDRON DEWITT MILLER

In a note published in 'The Auk' (1918, p. 352) the writer advocated the union in one genus, *Megaceryle*, of all the large, conspicuously crested Ceryline Kingfishers. These had been divided by Mr. Ridgway (Birds N. and Mid. America, Pt. VI, 407) into *Megaceryle* and *Streptoceryle*. At that time I overlooked the fact that *Streptoceryle* might be inadmissible on nomenclatural as well as on zoological grounds.

### I. NOMENCLATURE.

In my 'Revision of the Classification of the Kingfishers' (Bull. Amer. Mus. Nat. Hist., XXX, 1912, p. 265) the type of *Megaceryle* Kaup, 1848, was given as *M. maxima* by subsequent designation of Gray in 1855. The early history of the genus *Megaceryle* is briefly as follows:

*Megaceryle* new subgenus, Kaup, 1848. Contained four species, all of which are still referred to it when the genus is used in the broad sense.

"*Megaceryle* Kaup," Reichenbach, 1851. (Handb. Alced.) The same species given by Kaup, (except that the Asiatic spec-

ies *M. guttata* was replaced in *Ceryle*) with three others, none of which is more than subspecifically distinct.

"*Megaceryle* Reich." Bonaparte, 1854. (Consp. Volucr. Anisod.) The same Old World species given by Kaup with the addition of *M. lugubris* (the Japanese representative of the continental Asiatic *M. guttata*, perhaps only subspecifically distinct). A new genus, *Streptoceryle*, was proposed for the two American species.

"*Megaceryle* Reichenb. 1851" Gray, 1855 (Cat. Gen. and Subgen. of Birds). Type "(*Alcedo maxima*, Pall.)."

As stated in my paper, "In specifying the *last* species as the type (*maxima* being the fourth and last species mentioned by Kaup) Gray was probably influenced by Reichenbach's ill-advised action (in 1851) in transferring *guttata* (*guttulata*) from *Megaceryle* back to true *Ceryle*, and by Bonaparte's removal (in 1854) of *torquata* and *alcyon* to his genus *Streptoceryle* leaving only the single species *maxima* in *Megaceryle*. Possibly also the fact of there being two *guttatas*, that of *Boddart* (= *maxima* Pallas) and that of *Vigors* (= *guttulata* Stejn.) made it seem undesirable to Gray to fix *guttata* as the type." *M. maxima* stood first both in Reichenbach's and Bonaparte's arrangements.

*Chloroceryle* and *Megaceryle* were proposed by Kaup in the same sentence, both as subgenera. Reichenbach credited both to Kaup, raising them to generic rank. Bonaparte credited *Chloroceryle* to Kaup, but for some unexplained reason or more probably through carelessness gave Reichenbach as the authority for *Megaceryle*. Gray, a year later, credited both genera to Reichenbach.

Five years later (1860) Cabanis and Heine proposed the name *Ichthyonomus*\* for the African species *M. maxima*, quoting as a synonym "*Megaceryle* Rchb. 1851 (nec Kaup 1848)," properly crediting *Megaceryle* to Kaup but restricting it to *guttata* and *lugubris*. It is not evident whether they overlooked or purposely ignored Gray's designation of *maxima* as the type of *Megaceryle*.

In the 'Hand-list of Birds' (1869) Gray followed the arrangement of Cabanis and Heine, thereby repudiating his original type

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\* In the Birds of North and Middle America (Pt. VI. p. 407) this name is erroneously quoted as "*Ichthyonomus*."

designation. Sharpe (Monograph Alcedinidæ, 1870, and Catalogue of Birds, 1892) also gave *guttata* as the type of *Megaceryle*. The A. O. U. 'Check-List' (Third Edition, 1910, p. 183) however, gives *maxima* as the type of *Megaceryle*, following Gray's original designation. Mr. Ridgway, on the other hand, follows Cabanis and Sharpe in considering *guttata* as the type.

The fact that Gray credited *Megaceryle* to Reichenbach does not, in my opinion, affect the validity of his designation of *maxima* as the type. Reichenbach himself gave Kaup as the authority for the genus, and used the name in the same sense except for the omission of *M. guttata*. Bonaparte, however, although accrediting the genus to Reichenbach, restored *M. guttata* to its former place. If *Megaceryle* Kaup and *Megaceryle* Reichenbach are not considered identical from a nomenclatural point of view, at least the latter can be treated as equivalent to a substitute name. In this case the type of *Megaceryle* Reichenbach, *M. maxima*, becomes *ipso facto* the type of *Megaceryle* Kaup. Dr. J. A. Allen has shown (Bull. Amer. Mus. Nat. Hist., 1910, 332) that *Ispida* Brisson 1760 may be considered a substitute name for *Alcedo* Linn. 1758, thus rendering *Ispida* a synonym and obviating the possible necessity of having to use *Alcedo* in place of *Megaceryle*. I have had some correspondence with Dr. Chas. W. Richmond regarding the nomenclature of this group and wish to express my indebtedness for his advice.

With *M. maxima* as the type of *Megaceryle* this becomes the proper generic name for the American species, it now being universally agreed that the latter are congeneric with the African species. Bonaparte in proposing *Streptoceryle* for *M. torquata* and *M. alcyon* considered *M. maxima* to be more nearly allied to *M. guttata* (= *guttulata*) than to the American species.

## II. GENERIC AND SUBGENERIC CHARACTERS.

If the Asiatic species *M. guttulata* and *M. lugubris* are considered worthy of generic rank they must be given a new name. As stated in my note in 'The Auk' already mentioned, I do not believe this necessary for the following reasons: first, because the differences are virtually bridged by intermediates; second

because *M. alcyon* is nearly if not quite as distinct from *M. torquata* and *M. maxima* as is *M. guttulata*; third, because if *Megaceryle* is divided *Chloroceryle* must also be split up, for *C. amazona* stands alone in several respects.

A character of *M. guttulata* and *M. lugubris* that has not been pointed out is the considerably more extensive fusion of the third and fourth toes as compared with *M. torquata* and *M. alcyon*. In the former these toes are united to a point opposite the base of the claw of the second toe or sometimes even decidedly beyond; in the latter the union falls decidedly short of this point. *M. maxima* is perfectly intermediate; the toes are united just to the point mentioned or sometimes a little short of it. In this character *Ceryle* agrees with *Megaceryle torquata* and *M. alcyon*, while *Chloroceryle* agrees with *M. guttulata* and *M. lugubris*.

Further study has brought out additional characters separating the genera of Ceryline Kingfishers. In *Ceryle* and *Megaceryle* (*M. alcyon* and *M. torquata* examined) the greater secondary coverts of the under side of the wing although vestigial are distinct; in *Chloroceryle* (*C. amazona* and *C. americana* examined) these coverts are utterly wanting. In *Ceryle* and in *Chloroceryle* (all except *aenea* examined) the slip of the deep plantar tendon that supplies the hallux leaves the main tendon decidedly above the point where the latter trifurcates to supply the anterior toes. In *Megaceryle* (only *M. alcyon* examined) the four branches all originate at nearly the same point.

In *Megaceryle* (perhaps most so in *M. lugubris*) the planta tarsi is strongly papillose. In the three smaller species of *Chloroceryle* (subgenus *Amazonis*) the tarsus is not at all papillose while in *C. amazona* and *Ceryle* it is intermediate and apparently somewhat variable. Some specimens of *Ceryle* agree well with *Megaceryle*, in others the tarsus is less papillose. *Chloroceryle amazona* is nearer the smaller species of the genus, the tarsus never being as papillose as in *Megaceryle*.

I find that *Ceryle varia* agrees with *Chloroceryle amazona* and *Megaceryle* in having eighteen secondaries, these differing from the three smaller species of *Chloroceryle* which have but fourteen or fifteen secondaries. Dr. C. W. Richmond (Proc. U. S. Nat. Mus. 1893, 16, p. 511) states that the voice of *Chloroceryle*

*amazona* is quite different from that of the smaller species of the genus, much more resembling that of *Megaceryle alcyon* and *M. torquata*.

In my 'Revision' I quoted from P. Chalmers Mitchell's paper on the 'Anatomy of the Kingfishers' (Ibis, 1901, 120) regarding the deep plantar tendons of *Megaceryle* and *Chloroceryle*. Mr. Mitchell's description and figures show a striking difference between these two genera in the arrangement of the tendons. Of *Megaceryle* he described *M. maxima* and *M. alcyon*; of *Chloroceryle*, *C. americana* and *C. inda*. I have examined *M. alcyon*, *C. americana*, *C. inda*, *C. amazona* and *Ceryle varia*. My dissection of *M. alcyon* agrees essentially with that of Mitchell. On the other hand, my diagrams of the tendons of *Chloroceryle americana* and *C. inda* differ in important respects from Mitchell's figures of these species. They, as well as *C. amazona* and *Ceryle varia*, all agree essentially with each other and differ from Mitchell's figure of *M. alcyon* only in the position of the branch to the hallux. In *Megaceryle* the *flexor perforans digitorum* divides almost simultaneously into four branches, one for each toe, while in the other genera the slip for the hallux leaves the main tendon decidedly above the point where the tendon divides to supply the anterior toes. My dissections were made with great care, knowing that they did not agree with Mitchell's results, and a second specimen of *C. americana* was examined as a check upon the first; I therefore feel confident that the above statements are correct.

The following key shows the main differences, both internal and external, not only between the genera of the Cerylinae but also between the more marked groups of species.

- a DIASTATAXIC; acrotarsuim scutellate; anterior toes shorter; upper parts not green; sexes alike in color of axillars; maxillary bone abruptly and somewhat more broadly expanded.
- b A conspicuous vertical crest; bill stouter, its rami not overlapt by interramal plumage, the tomlia more or less distinctly serrate; tarsus and hallux shorter and stouter; tail more rounded, rectrices not widened terminally, somewhat pointed; plumage rather harsh and lusterless, partly blue-gray and rufus, with no large white areas in scapulars, secondaries, outer webs of primaries, nor tail; larger (wing more than

144 mm). Clavicle with no distinct process near proximal end; coracoid with an upstanding process at inner side of foot; spina sterni externa shorter; projection on outer edge of preilium conspicuous; lacrymal less swollen, reaching maxillary; tendinal slip to hallux arising at end of tendon (*Megaceryle*)

- c Culmen more curved and with thicker tip; crest larger; 3rd and 4th toes more extensively united.

*Megaceryle lugubris*

*Megaceryle guttulata*

- cc Culmen straighter and with more slender tip; crest smaller, 3rd and 4th toes less extensively united.

- d Bill stouter, the culmen nearly straight, the tomial serrations distinct; crest smaller; 10th primary nearer 6th than 7th (rarely exceeding 6th). Male with rufus in plumage; female with under wing-coverts rufous; larger (wing not less than 180 mm).

*Megaceryle maxima*

*Megaceryle torquata*

- dd Bill more slender, the culmen distinctly curved, the tomial serrations less distinct, often obsolete; crest larger; 10th primary nearer 7th than 6th (always decidedly longer than 6th). Male with no rufous; female with under wing-coverts white; smaller (wing not more than 170 mm).

*Megaceryle alcyon.*

- bb No vertical crest; bill more slender, its rami overlapt by interramal plumage, the tomia entire; tarsus and especially hallux longer and more slender; tail less rounded, rectrices broadened and obtusely rounded terminally; plumage soft and silky, wholly black and white, with large white areas in scapulars, remiges and rectrices; smaller, (wing less than 144 mm). Clavicle with a distinct process near proximal end; coracoid with no upstanding process at inner side of foot; spina sterni externa longer; projection on outer edge of preilium very small; lacrymal much swollen, not reaching maxillary; tendinal slip to hallux arising above end of tendon. (*Ceryle*).....*Ceryle varia*.

- aa EUTAXIC; acrotarsium not scutellate; anterior toes longer; upper parts glossy bronze-green; sexes differing in color of axillars; maxillary bone gradually and somewhat less broadly expanded. Other skeletal characters and plantar tendons as in *Ceryle varia*. (Differing further from *Megaceryle* in absence of vertical crest; entire tomia, and longer tarsus and hallux; and from *Ceryle* in more extensively fused anterior toes, shorter wing-tip, tenth primary shorter than sixth instead of longer; more rounded tail, and presence of rufous in plumage). (*Chloroceryle*).

- b A conspicuous occipital crest; 18 secondaries; tail graduated for one-thirteenth of its length; 2nd toe with claw normally exceeding 4th without claw; outer webs of secondaries uniform green; green chest-band incomplete, the feathers not barred; larger (wing 125–146 mm)...*Chloroceryle amazona*.
- bb Scarcely crested; 14 or 15 secondaries; tail graduated for one-fifth or one-sixth of its length; 2nd toe with claw rarely exceeding 4th without claw; outer webs of secondaries light-spotted; green chest-band complete, the feathers barred; smaller (wing 54–106 mm).....*Chloroceryle americana*  
*Chloroceryle inda*  
*Chloroceryle ænea*

The interrelationships not expressed in the key may be briefly stated. *Megaceryle maxima* agrees with *M. lugubris* and *M. guttulata* in the pattern of the primaries and approaches them in the markings of the upperparts and in the extent of cohesion of the toes. *M. alcyon* resembles these same two species in the slight development of the tomial serrations, and approaches them in the curvature of the bill and the size of the crest. *M. torquata* is practically identical with *M. alcyon* in the union of the toes and in the color of the upperparts, but *M. t. stellata* recalls *M. maxima* in the pattern of the upper surface.

At the time my paper was written no skeleton of *Ceryle varia* was available and the skull only of *Chloroceryle amazona*. I now have a complete skeleton of each of these species and am able to compare them with skeletons of *Megaceryle alcyon*, *M. torquata* and *Chloroceryle americana*.

*Chloroceryle amazona* resembles *C. americana* in the coracoid, spina sterni, and preiliac process; in the form of the clavicle it is intermediate between its congener and *Megaceryle*.

As indicated in the accompanying key, *Ceryle* agrees with *Megaceryle* in the form of the expanded maxillary, and with *Chloroceryle* in the shape of the coracoid and clavicle, in the long spina sterni, in the narrow lacrymal, the descending process of which is greatly swollen and does not reach the maxillary, and in the small size of the preiliac process. The anterior edge of the sternal keel agrees with that of *Chloroceryle amazona* and both of these species are in this feature intermediate between *Megaceryle* and *Chloroceryle americana*. In the relation of the pars plana to the



descending process of the lacrymal *Ceryle* is intermediate between the two other genera.

In internal characters therefore, at least in the skeleton and the deep plantar tendons, *Ceryle* bears a much closer resemblance to *Chloroceryle* than to *Megaceryle*, agreeing better with the latter only in the somewhat broader maxillary. While this conclusion is probably correct it cannot be considered final until confirmed by examination of the remaining species, particularly *Megaceryle guttulata* or *M. lugubris*.

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## ONTARIO BIRD NOTES.

BY J. H. FLEMING AND HOYES LLOYD.

THE following notes refer chiefly to the birds of Toronto, Ontario, although there are some references to occurrences in other parts of the Province.

Since the senior author published his article "Birds of Toronto, Ontario,"<sup>1</sup> twelve years ago, there has been much change in conditions affecting bird-life near Toronto. The land birds have not been seriously affected. The ravines, especially those of the Don and Humber Rivers, form decided obstacles to the expansion of the city and still contain wooded tracts which provide shelter and food for many migrants. However, the Humber River is now flanked by an automobile road and since the completion of the Bloor Street Viaduct the ravines of the Don Valley, already cut up by railroads, will soon be absorbed in the ever-growing city.

There has been a large aerial training camp on the banks of the Don, from which aeroplanes have been flying in scores for the past three years, but they did not drive away the smaller birds. Large hawks and gulls have been seen, pursued by the cadets in their aeroplanes, and fleeing in terror before such huge

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<sup>1</sup> Auk XXIII, pp. 437-453 and Auk XXIV pp. 71-89.